

Invoice

P.O. Box 22648
Long Beach, CA 90801-5648
Phone: 562-590-6500

Robert Law
De Maximis Inc.
186 Center Street, Suite 290
Clinton, NJ 08809

March 06, 2014
Project No: 6664-01
Invoice No: 68359

Project 6664-01 Lower Passaic River/Newark Bay TOM 7

Professional Services from December 01, 2013 through January 25, 2014

Phase	K	TOM 7
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Task	01	Coordination and Meetings
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Professional Personnel

	Hours	Rate	Amount	
Engineer/Scientist III				
Canizares, Rafael	46.00	191.00	8,786.00	
Engineer/Scientist II				
Mathew, Rooni	52.00	169.00	8,788.00	
Totals	98.00		17,574.00	
Total Labor				17,574.00
		Total this Task		\$17,574.00

Task	02	Data Analysis and Monitoring Design
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Professional Personnel

	Hours	Rate	Amount
Engineer/Scientist III			
Canizares, Rafael	4.00	191.00	764.00
Engineer/Scientist II			
Mathew, Rooni	99.50	169.00	16,815.50
Staff Engineer/Scientist			
Xiong, Yi	31.00	117.00	3,627.00

ACH Payment Remittance Information Bank Account Name: Moffatt & Nichol Bank Number: 4159349729 Routing: 121000248
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Project	6664-01	Lower Passaic River/Newark Bay TOM 7	Invoice	68359
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Support Staff Engineer				
Manian, Dinesh	45.00	100.00	4,500.00	
Totals	179.50		25,706.50	
Total Labor				25,706.50
		Total this Task		\$25,706.50

Task	03	System Understanding
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Professional Personnel

	Hours	Rate	Amount	
Engineer/Scientist III				
Canizares, Rafael	64.00	191.00	12,224.00	
Engineer/Scientist II				
Mathew, Rooni	4.00	169.00	676.00	
Support Staff Engineer				
Manian, Dinesh	84.00	100.00	8,400.00	
Totals	152.00		21,300.00	
Total Labor				21,300.00
		Total this Task		\$21,300.00

Task	04	LPR/NB Hydrodynamic Model
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Professional Personnel

	Hours	Rate	Amount	
Engineer/Scientist II				
Mathew, Rooni	13.00	169.00	2,197.00	
Support Staff Engineer				
Manian, Dinesh	24.00	100.00	2,400.00	
Totals	37.00		4,597.00	
Total Labor				4,597.00
		Total this Task		\$4,597.00

Task	05	LPR/NB Sediment Transport Model
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Professional Personnel

	Hours	Rate	Amount	
Engineer/Scientist III				
Canizares, Rafael	2.00	191.00	382.00	
Engineer/Scientist II				
Mathew, Rooni	94.00	169.00	15,886.00	
Staff Engineer/Scientist				
Xiong, Yi	73.50	117.00	8,599.50	

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Support Staff Engineer				
Manian, Dinesh	110.00	100.00	11,000.00	
Totals	279.50		35,867.50	
Total Labor				35,867.50
		Total this Task		\$35,867.50

Task	06	LPR/NB Organic Carbon Model
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Professional Personnel

	Hours	Rate	Amount	
Engineer/Scientist II				
Mathew, Rooni	26.00	169.00	4,394.00	
Staff Engineer/Scientist				
Xiong, Yi	3.00	117.00	351.00	
Totals	29.00		4,745.00	
Total Labor				4,745.00
		Total this Task		\$4,745.00

Task	07	LPR/NB Contaminant Fate & Transport
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Professional Personnel

	Hours	Rate	Amount	
Engineer/Scientist II				
Mathew, Rooni	19.50	169.00	3,295.50	
Staff Engineer/Scientist				
Xiong, Yi	27.50	117.00	3,217.50	
Totals	47.00		6,513.00	
Total Labor				6,513.00
		Total this Task		\$6,513.00

Task	XY	Expenses
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Reimbursable Expenses

Postage & Delivery			36.00	
Computer Software & Hardware			451.78	
Total Reimbursables			487.78	487.78
		Total this Task		\$487.78
		Total this Phase		\$116,790.78

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Project	6664-01	Lower Passaic River/Newark Bay TOM 7		Invoice	68359
Limit		Current	Prior	To-Date	
Total Billings		116,790.78	474,425.33	591,216.11	
Limit				746,232.00	
Remaining				155,015.89	
TOTAL DUE THIS INVOICE					\$116,790.78

Please remit payment of this invoice to: Moffatt & Nichol
 ABA #121000248
 Account #4159349729
 Swift #WFBUS6WFFX
 Wells Fargo Bank
 111 W. Ocean Blvd., Suite 300
 Long Beach, CA 90802 USA

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Billing Backup

Thursday, March 06, 2014

Moffatt & Nichol

Invoice 68359 Dated 3/6/2014

2:48:31 PM

Project	6664-01	Lower Passaic River/Newark Bay TOM 7
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Phase	K	TOM 7
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Task	01	Coordination and Meetings
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Professional Personnel

			Hours	Rate	Amount
Engineer/Scientist III					
1548	Canizares, Rafael	12/7/2013	1.00	191.00	191.00
1548	Canizares, Rafael	12/7/2013	2.00	191.00	382.00
	call with AQEA. Simulations, coordination on models				
1548	Canizares, Rafael	12/14/2013	2.00	191.00	382.00
	call with AQEA - status and EPA deliverables				
1548	Canizares, Rafael	12/14/2013	2.00	191.00	382.00
	internal discussion and communications with PC and AQEA on deliverables for EPA				
1548	Canizares, Rafael	12/21/2013	2.00	191.00	382.00
1548	Canizares, Rafael	12/21/2013	2.00	191.00	382.00
	Discussion with AQEA about projections and future runs				
1548	Canizares, Rafael	12/21/2013	2.00	191.00	382.00
	review invoices from Deltares and incorporate to M&N invoices				
1548	Canizares, Rafael	12/28/2013	4.00	191.00	764.00
	Prepare invoice. Review, October November Invoices				
1548	Canizares, Rafael	1/11/2014	4.00	191.00	764.00
1548	Canizares, Rafael	1/11/2014	1.00	191.00	191.00
	RI report review and writing				
1548	Canizares, Rafael	1/18/2014	1.00	191.00	191.00
1548	Canizares, Rafael	1/18/2014	4.00	191.00	764.00
	Prepare invoices				
1548	Canizares, Rafael	1/18/2014	5.00	191.00	955.00
	call with AQEA, review TC presentation, internal discussion of ST model results,				
1548	Canizares, Rafael	1/25/2014	4.00	191.00	764.00
1548	Canizares, Rafael	1/25/2014	4.00	191.00	764.00
	complete Invoice				
1548	Canizares, Rafael	1/25/2014	6.00	191.00	1,146.00
	Prepare document of TOM7 tasks				
Engineer/Scientist II					
2219	Mathew, Rooni	12/7/2013	3.00	169.00	507.00

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	Call-in to TC mtng					
2219	Mathew, Rooni	12/7/2013	1.50	169.00	253.50	
	Compile attachments for CPG-EPA letter for Nov 22					
2219	Mathew, Rooni	12/7/2013	2.00	169.00	338.00	
	Conf call w AQEA to discuss TC mtng, calibrn strategy, devel. HD/ST presn for TC mtng					
2219	Mathew, Rooni	12/14/2013	2.00	169.00	338.00	
	Compile projection runs for transmittal to QEA/EPA, compile latest HD/ST outputs for QEA					
2219	Mathew, Rooni	12/14/2013	1.00	169.00	169.00	
	Conf call w QEA to discuss code/input/output transmittal to EPA					
2219	Mathew, Rooni	12/14/2013	1.00	169.00	169.00	
	Devel inventory of codes/inputs/outputs to transfer per EPA request					
2219	Mathew, Rooni	12/21/2013	8.00	169.00	1,352.00	
	Compile material for EPA, devel OC linkage example					
2219	Mathew, Rooni	12/21/2013	5.00	169.00	845.00	
	Compile material for EPA					
2219	Mathew, Rooni	12/21/2013	4.00	169.00	676.00	
	Conf call w AQEA to discuss FFS runs, transmit remaining 1112 files to HQI					
2219	Mathew, Rooni	12/21/2013	5.00	169.00	845.00	
	Relaunch runs for transfer to EPA to save correct linkage, transfer files to EPA					
2219	Mathew, Rooni	1/4/2014	2.00	169.00	338.00	
	Devel. options for HD/ST runs for FFS projn runs					
2219	Mathew, Rooni	1/11/2014	4.00	169.00	676.00	
	Call-in TC mtng					
2219	Mathew, Rooni	1/11/2014	4.00	169.00	676.00	
	Devel. presn for TC mtng					
2219	Mathew, Rooni	1/11/2014	1.00	169.00	169.00	
	Conf call w QEA to discuss FFS runs, TC mtng, new ST run					
2219	Mathew, Rooni	1/11/2014	2.00	169.00	338.00	
	Transmit ST/CFT projection results to AQEA					
2219	Mathew, Rooni	1/18/2014	2.00	169.00	338.00	
	Devel proposal for rev linkage & discuss w AQEA					
2219	Mathew, Rooni	1/25/2014	.50	169.00	84.50	
	Devel. agenada for Feb 4 MSC meeting					
2219	Mathew, Rooni	1/25/2014	4.00	169.00	676.00	
	Devel. presn for Feb 4 MSC mtng					
	Totals		98.00		17,574.00	
	Total Labor					17,574.00

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Total this Task			\$17,574.00	

Task	02	Data Analysis and Monitoring Design
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Professional Personnel

			Hours	Rate	Amount
Engineer/Scientist III					
1548	Canizares, Rafael	12/21/2013	2.00	191.00	382.00
	Prepare bathymetry for propeller scour				
1548	Canizares, Rafael	1/18/2014	2.00	191.00	382.00
	review vessel data				
Engineer/Scientist II					
2219	Mathew, Rooni	12/14/2013	1.50	169.00	253.50
	Discuss PWCM data issues w OSI, devel data plots for OSI				
2219	Mathew, Rooni	12/21/2013	2.50	169.00	422.50
	Revise Fall ABS-SSC regressions				
2219	Mathew, Rooni	12/21/2013	4.00	169.00	676.00
	Devel. revised ABS-SSC estimates				
2219	Mathew, Rooni	12/21/2013	3.00	169.00	507.00
	Revise Fall ABS-SSC regressions				
2219	Mathew, Rooni	12/28/2013	2.00	169.00	338.00
	Correct 0910 BCs w rev DD rating curve for clays/silts/sand				
2219	Mathew, Rooni	1/4/2014	14.00	169.00	2,366.00
	Revise Fall PWCM ABS-SSC				
2219	Mathew, Rooni	1/4/2014	4.00	169.00	676.00
	Finalize DD rating curve and GSD inputs, devel sens runs w 7 classes				
2219	Mathew, Rooni	1/11/2014	16.00	169.00	2,704.00
	Review LPR Sedflume data, devel alternative TauCr and consol model inputs				
2219	Mathew, Rooni	1/18/2014	25.50	169.00	4,309.50
	Reprocess Fall ABS-SSC analyses - flux balances, fluff layer re-entrainment analysis, etc.				
2219	Mathew, Rooni	1/18/2014	4.00	169.00	676.00
	Revise fluff layer props w shear stresses form latest bathy				
2219	Mathew, Rooni	1/25/2014	10.00	169.00	1,690.00
	Devel Spring PWCM ABS-SSC relationship				
2219	Mathew, Rooni	1/25/2014	3.00	169.00	507.00
	Review navigation scour data analysis				
2219	Mathew, Rooni	1/25/2014	7.00	169.00	1,183.00
	Review navigation scour data analysis, filter/standardize Fall PWCM data for model-data comparisons				
2219	Mathew, Rooni	1/25/2014	3.00	169.00	507.00
	filter/standardize Fall PWCM data for model-data comparisons				

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Staff Engineer/Scientist						
2403	Xiong, Yi	12/21/2013	15.00	117.00	1,755.00	
	Collect data and materials; Find and sort stuff.					
2403	Xiong, Yi	12/28/2013	8.00	117.00	936.00	
	Collect data and materials; Find and sort stuff; Discuss and Transfer Data.; Work on silt settling velocity.					
2403	Xiong, Yi	12/28/2013	8.00	117.00	936.00	
	Collect data and materials; Find and sort stuff; Discuss and Transfer Data; work on settling velocity calculation using Cheng's method.					
Support Staff Engineer						
2301	Manian, Dinesh	12/14/2013	6.00	100.00	600.00	
2301	Manian, Dinesh	12/14/2013	12.00	100.00	1,200.00	
	Analysing AIS ship traffic data; correlations with bathymetric change					
2301	Manian, Dinesh	12/28/2013	16.00	100.00	1,600.00	
	Bathymetric data analysis: Longitudinal variability in gross erosion and accumulation during periods between subsequent surveys 1995 to 2012					
2301	Manian, Dinesh	1/4/2014	8.00	100.00	800.00	
	Processing bathymetric data to set up detailed model-data comparisons of bathymetric change between subsequent surveys					
2301	Manian, Dinesh	1/11/2014	3.00	100.00	300.00	
	Setting up model-data comparisons of bathymetric change					
	Totals		179.50		25,706.50	
Total Labor						25,706.50
Total this Task						\$25,706.50

Task 03 System Understanding

Professional Personnel

			Hours	Rate	Amount
Engineer/Scientist III					
1548	Canizares, Rafael	12/7/2013	2.00	191.00	382.00
	Internal discussions, upstream boundary, model updates for ST, other.				
1548	Canizares, Rafael	12/14/2013	12.00	191.00	2,292.00
	Lower LPR bathymetry analysis and Propeller wash calculation				
1548	Canizares, Rafael	12/21/2013	20.00	191.00	3,820.00
	Development of bathymetry maps, Scour calculations				
1548	Canizares, Rafael	12/28/2013	8.00	191.00	1,528.00
	Propeller wash analysis				
1548	Canizares, Rafael	1/11/2014	4.00	191.00	764.00
1548	Canizares, Rafael	1/18/2014	10.00	191.00	1,910.00
	Propeller Wash				
1548	Canizares, Rafael	1/25/2014	8.00	191.00	1,528.00
	Propeller Wash - integration with model.				

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Engineer/Scientist II						
2219	Mathew, Rooni	1/18/2014	4.00	169.00	676.00	
Review system understanding w latest ABS-SSC estimates, compare to model performance						
Support Staff Engineer						
2301	Manian, Dinesh	12/7/2013	8.00	100.00	800.00	
Processing non-stationary wave runs; Sensitivity to wind-wave growth formulations						
2301	Manian, Dinesh	12/7/2013	8.00	100.00	800.00	
Processing wave sensitivity runs to formulation for wind-wave generation; Comparisons with data						
2301	Manian, Dinesh	12/21/2013	16.00	100.00	1,600.00	
Sensitivity runs to estimate effect of waves on total shear stress in NB; Correlation between density of ship traffic and bathymetric change						
2301	Manian, Dinesh	12/28/2013	8.00	100.00	800.00	
Comparing measured longitudinal variability in bathymetric change, with the variability in model predicted changes						
2301	Manian, Dinesh	1/11/2014	16.00	100.00	1,600.00	
Settling velocity computation using re-processed ABS data from Fall PWCM						
2301	Manian, Dinesh	1/18/2014	12.00	100.00	1,200.00	
Comparing volume of erosion near RM 0 due to ship traffic with volume of sediment flux through the cross-section to understand their relative significance						
2301	Manian, Dinesh	1/25/2014	16.00	100.00	1,600.00	
Assessing and modeling impact of ship traffic on bed scour in lower mile and NB						
Totals			152.00		21,300.00	
Total Labor						21,300.00
Total this Task						\$21,300.00

Task 04 LPR/NB Hydrodynamic Model

Professional Personnel

			Hours	Rate	Amount
Engineer/Scientist II					
2219	Mathew, Rooni	12/28/2013	6.00	169.00	1,014.00
	Devel & review sal model-data for CWCM w 2004 bathy & EPA BCs				
2219	Mathew, Rooni	1/11/2014	7.00	169.00	1,183.00
	Debug hydro instabilities in transition from 1 bathy to another in NB				
Support Staff Engineer					
2301	Manian, Dinesh	12/7/2013	8.00	100.00	800.00
	Setting up non-stationary wave simulation; Model-data comparisons;				
2301	Manian, Dinesh	12/21/2013	8.00	100.00	800.00

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Project	6664-01	Lower Passaic River/Newark Bay TOM 7	Invoice	68359
2301	Debugging computation of combined wave-current stresses in ECOM			
	Manian, Dinesh	1/18/2014	8.00 100.00	800.00
	Processing non-stationary wave model results for external wave inputs to long-term ECOM model			
	Totals		37.00	4,597.00
	Total Labor			4,597.00
			Total this Task	\$4,597.00

Task	05	LPR/NB Sediment Transport Model
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Professional Personnel

			Hours	Rate	Amount
	Engineer/Scientist III				
1548	Canizares, Rafael	1/11/2014	2.00	191.00	382.00
	discuss status and results of ST model				
	Engineer/Scientist II				
2219	Mathew, Rooni	12/7/2013	6.50	169.00	1,098.50
	Review/finalize new DD solids rating curve, devel new BCs, launch projn run for Alt 6 w MNR bathy & solids release, review/respond to SEA Spring PWCM ADCP issues				
2219	Mathew, Rooni	12/7/2013	8.00	169.00	1,352.00
	Debug optional advection/dispersion code, review ST sens runs w rev DD rating curve				
2219	Mathew, Rooni	12/7/2013	19.00	169.00	3,211.00
	Debug optional advection/dispersion code				
2219	Mathew, Rooni	12/7/2013	6.00	169.00	1,014.00
	Discuss ST code issues w selective advection/dispersion w HQI, review wave analysis, rev solids rating curve BCs, devel high flow sens runs w new BCs, review PWCM data issues w OSI				
2219	Mathew, Rooni	12/7/2013	8.00	169.00	1,352.00
	Launch rev ST run w old solids BCs, debug ST run w optional advection-dispersion for NC2/3				
2219	Mathew, Rooni	12/14/2013	8.00	169.00	1,352.00
	Debug model with optional advection-dispersion, debug Alt 6 w solids release & relaunch runs, review sens w new DD solids rating curve				
2219	Mathew, Rooni	12/14/2013	5.50	169.00	929.50
	Debug model with optional advection-dispersion				
2219	Mathew, Rooni	12/14/2013	8.00	169.00	1,352.00
	Debug model with optional advection-dispersion & review w HQI				

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2219	Mathew, Rooni	12/14/2013	6.00	169.00	1,014.00	
	Devel/test code for optional water column vertical profile calculations, devel. ABS-SSC relation for Fall PWCM					
2219	Mathew, Rooni	12/14/2013	6.00	169.00	1,014.00	
	Test code w 4 coh classes w prob depn bug fix, review sens runs w new solids rating curve and sens to critical shear stress multiple					
2219	Mathew, Rooni	12/21/2013	4.00	169.00	676.00	
	Test/debug ST run w 4 coh classes					
2219	Mathew, Rooni	12/28/2013	2.00	169.00	338.00	
	Code changes for C1-C2 transfser					
2219	Mathew, Rooni	1/25/2014	2.50	169.00	422.50	
	Review ST runs, launch addnl sens., launch 0506-1213 runs for MSC mtng					
2219	Mathew, Rooni	1/25/2014	4.50	169.00	760.50	
	Review ST runs, launch addnl sens.					
	Staff Engineer/Scientist					
2403	Xiong, Yi	12/7/2013	7.00	117.00	819.00	
	Get the TSS data and generate the TSS time series plots; Take a look at the plots; generate another sets of pdf plots.					
2403	Xiong, Yi	12/7/2013	7.50	117.00	877.50	
	Discuss Rating Curve fitting; Set upsteps to update 5 and 7 classes of sediment boundary inputs.Calculate sediment load and sediment concentration for a particular year.					
2403	Xiong, Yi	12/7/2013	8.00	117.00	936.00	
	Generate new TSS plots; Work on Matlab and Fortran programs to extractTSS data from sediment and hydrodynamic outputsfor the 4-panel TSS 0910 time series plots.					
2403	Xiong, Yi	12/7/2013	8.50	117.00	994.50	
	Launch the updated sediment boundary run and 2 sediment transport sensivity runs. Generate time series TSS plots; Modify the input read and write programs to re-generate the coh_sed.inp files and the TSS time series plots.					
2403	Xiong, Yi	12/7/2013	9.00	117.00	1,053.00	
	Verify and generate 5 and 7 classes coh_sed.inp for all 19 years. Make TSS boundary plots for original and updated coh_sed.inp files. Launch the original sediment transport testing run.					
2403	Xiong, Yi	12/14/2013	6.00	117.00	702.00	
	Compare the new and sensitivity run results and cross plots; Compare rating curve vs measured data.					
2403	Xiong, Yi	12/14/2013	8.50	117.00	994.50	
	Debug and modify Matlab script and re-generate the measured & Estimated data plot; Revise Fortran program to update coh_sed.inp files. Re-generate sediment boundary plot. Re-launch the 3 testing runs with updated coh_sed.inp files.					

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2403	Xiong, Yi	12/14/2013	8.50	117.00	994.50	
	Explan the coh_sed.inp update steps and show the results. See the boundary TSS results. Work on 0910 TSS boundary (coh_sed.inp.0910) based on both rating curve and observed data.					
2403	Xiong, Yi	12/14/2013	3.50	117.00	409.50	
	Work on 0910 TSS boundary (coh_sed.inp.0910)based on both rating curve and observed data.					
2403	Xiong, Yi	12/14/2013	7.00	117.00	819.00	
	Make plots, revise time series plots and generate the slides for TSS boundary condition analysis. Launch 3 long terms sediment transport runs.					
Support Staff Engineer						
2301	Manian, Dinesh	12/7/2013	5.00	100.00	500.00	
	Setting up BCs for ST with smooth transition during bathymetry updates; based on latest full-grid runs					
2301	Manian, Dinesh	12/14/2013	2.00	100.00	200.00	
2301	Manian, Dinesh	12/14/2013	16.00	100.00	1,600.00	
	Sediment Transport sensitivity runs with effect of wave shear stress; Processing BCs for long-term runs and projection runs;					
2301	Manian, Dinesh	12/21/2013	3.00	100.00	300.00	
2301	Manian, Dinesh	12/21/2013	8.00	100.00	800.00	
	Setting up BCs for long term projection/sensitivity runs					
2301	Manian, Dinesh	12/28/2013	8.00	100.00	800.00	
	Detailed comparisons of bathymetric changes predicted by the model with bed changes based on survey data from 1995 to 2012					
2301	Manian, Dinesh	1/4/2014	8.00	100.00	800.00	
	Processing ST sensitivity runs to critical shear stress					
2301	Manian, Dinesh	1/11/2014	16.00	100.00	1,600.00	
	Processing ST sensitivity runs to critical shear stress, settling velocities					
2301	Manian, Dinesh	1/18/2014	20.00	100.00	2,000.00	
	ST model final calibration					
2301	Manian, Dinesh	1/25/2014	24.00	100.00	2,400.00	
	Processing final Sediment Transport sensitivity runs; Model-data comparisons					
	Totals		279.50		35,867.50	
	Total Labor					35,867.50
				Total this Task		\$35,867.50

Task	06	LPR/NB Organic Carbon Model
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ACH Payment Remittance Information Bank Account Name: Moffatt & Nichol Bank Number: 4159349729 Routing: 121000248
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Project	6664-01	Lower Passaic River/Newark Bay TOM 7	Invoice	68359
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Professional Personnel

			Hours	Rate	Amount
Engineer/Scientist II					
2219	Mathew, Rooni	12/7/2013	1.00	169.00	169.00
	Debug -ve values in AOC outputs				
2219	Mathew, Rooni	12/21/2013	.50	169.00	84.50
	Review AOC -ve concentratiion debugging				
2219	Mathew, Rooni	12/28/2013	6.00	169.00	1,014.00
	Review/debug AOC issues				
2219	Mathew, Rooni	1/4/2014	1.00	169.00	169.00
	Debug AOC code issues				
2219	Mathew, Rooni	1/11/2014	6.00	169.00	1,014.00
	Debug and comment on AOC code questions				
2219	Mathew, Rooni	1/18/2014	4.50	169.00	760.50
	Debug NEGPORE issue, debug run crash w clays a cohesive, debug ST-OC-CFT sedimentation rates issues				
2219	Mathew, Rooni	1/18/2014	7.00	169.00	1,183.00
	Review ST-OC bed thickness changes, revise code for clays as cohesive				
Staff Engineer/Scientist					
2403	Xiong, Yi	12/21/2013	1.00	117.00	117.00
	Start to look into the Negative Value errors;				
2403	Xiong, Yi	12/21/2013	2.00	117.00	234.00
	Revise hsed.s.f and make a testing run to show the results for QEA.				
	Totals		29.00		4,745.00
	Total Labor				4,745.00
	Total this Task				\$4,745.00

Task 07 LPR/NB Contaminant Fate & Transport

Professional Personnel

			Hours	Rate	Amount
Engineer/Scientist II					
2219	Mathew, Rooni	12/7/2013	1.00	169.00	169.00
	Launch RCA Alt 6 sens run with solids releases				
2219	Mathew, Rooni	12/14/2013	1.00	169.00	169.00
	Devel removal vol summary for Integral				
2219	Mathew, Rooni	12/28/2013	8.00	169.00	1,352.00
	Review processing scripts for projn runs, debug solids release run crashes				

ACH Payment Remittance Information Bank Account Name: Moffatt & Nichol Bank Number: 4159349729 Routing: 121000248
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Project	6664-01	Lower Passaic River/Newark Bay TOM 7			Invoice	68359
2219	Mathew, Rooni	1/4/2014	3.00	169.00	507.00	
	Devel options for HD/ST runs					
2219	Mathew, Rooni	1/18/2014	1.00	169.00	169.00	
	conf call w AQEA/Integral to discuss remediation inputs					
2219	Mathew, Rooni	1/25/2014	2.00	169.00	338.00	
	Respond to QEA ?s on model-data comparisons					
2219	Mathew, Rooni	1/25/2014	1.00	169.00	169.00	
	Discuss projection runs setup w AQEA					
2219	Mathew, Rooni	1/25/2014	2.50	169.00	422.50	
	Discuss projection runs setup w AQEA, post-process runs for foodchain output					
	Staff Engineer/Scientist					
2403	Xiong, Yi	12/14/2013	1.00	117.00	117.00	
	Generage and send QEA the outputs.					
2403	Xiong, Yi	12/14/2013	3.00	117.00	351.00	
	Work on QEA's outputs request.					
2403	Xiong, Yi	12/14/2013	.50	117.00	58.50	
	Send QEA foodchain data.					
2403	Xiong, Yi	12/14/2013	1.00	117.00	117.00	
	Launch Alt5 and Alt7 with the revised dredge files.					
2403	Xiong, Yi	12/21/2013	1.00	117.00	117.00	
	Provide RCATOX results to QEA.					
2403	Xiong, Yi	12/21/2013	8.00	117.00	936.00	
	Update inputs and Launch 3 7 classes' sediment transport runs; resume the long-term sediment transport run with new coh_sed.inp.					
2403	Xiong, Yi	12/21/2013	7.00	117.00	819.00	
	Work on 0910 coh_sed.inp; Make plot to compare Measured, Rating Curve, Old coh_sed.inp and New coh_sed.inp time series TSS.					
2403	Xiong, Yi	12/21/2013	6.00	117.00	702.00	
	Make TSS boundary comparison plots; Do 0910 7 classes plots; Clean disk, move runs and resume them. Look into QEA's post-processors.					
	Totals		47.00		6,513.00	
	Total Labor					6,513.00
	Total this Task					\$6,513.00

Task	XY	Expenses	
Reimbursable Expenses			
Postage & Delivery			
AP 196753	12/30/2013	Federal Express Corp / INV 250371898 TID 797395890880 / Invoice: 250371898, 12/20/2013	11.32
AP 196772	12/30/2013	Federal Express Corp / INV 251135835 TID 797475516541 / Invoice: 251135835, 12/27/2013	11.28

ACH Payment Remittance Information
Bank Account Name: Moffatt & Nichol
Bank Number: 4159349729
Routing: 121000248

Project	6664-01	Lower Passaic River/Newark Bay TOM 7		Invoice	68359
AP	196772	12/30/2013	Federal Express Corp / INV 251135835 TID 797464280912 / Invoice: 251135835, 12/27/2013	13.40	
Computer Software & Hardware					
EX	000000049943	12/12/2013	Mathew, Rooni / Office Depot	152.40	
EX	000000050136	12/17/2013	Mathew, Rooni / Office Depot	81.65	
EX	000000050680	1/9/2014	Mathew, Rooni / Office Depot	76.20	
EX	000000050680	1/14/2014	Mathew, Rooni / Office Depot	141.53	
Total Reimbursables				487.78	487.78
				Total this Task	\$487.78
				Total this Phase	\$116,790.78
				Total this Project	\$116,790.78
				Total this Report	\$116,790.78

ACH Payment Remittance Information
Bank Account Name: Moffatt & Nichol
Bank Number: 4159349729
Routing: 121000248

Invoice

P.O. Box 22648
Long Beach, CA 90801-5648
Phone: 562-590-6500

Robert Law
De Maximis Inc.
186 Center Street, Suite 290
Clinton, NJ 08809

March 06, 2014
Project No: 6664-01
Invoice No: 68359

Project 6664-01 Lower Passaic River/Newark Bay TOM 7

Professional Services from December 01, 2013 through January 25, 2014

Phase K TOM 7

Task 01 Coordination and Meetings

Professional Personnel

	Hours	Rate	Amount	
Engineer/Scientist III				
Canizares, Rafael	46.00	191.00	8,786.00	
Engineer/Scientist II				
Mathew, Rooni	52.00	169.00	8,788.00	
Totals	98.00		17,574.00	
Total Labor				17,574.00
		Total this Task		\$17,574.00

Task 02 Data Analysis and Monitoring Design

Professional Personnel

	Hours	Rate	Amount
Engineer/Scientist III			
Canizares, Rafael	4.00	191.00	764.00
Engineer/Scientist II			
Mathew, Rooni	99.50	169.00	16,815.50
Staff Engineer/Scientist			
Xiong, Yi	31.00	117.00	3,627.00

ACH Payment Remittance Information
Bank Account Name: Moffatt & Nichol
Bank Number: 4159349729
Routing: 121000248

Project	6664-01	Lower Passaic River/Newark Bay TOM 7	Invoice	68359
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Support Staff Engineer

Manian, Dinesh

45.00

100.00

4,500.00

Totals

179.50

25,706.50

Total Labor

25,706.50

Total this Task

\$25,706.50

Task 03 System Understanding

Professional Personnel

Hours

Rate

Amount

Engineer/Scientist III

Canizares, Rafael

64.00

191.00

12,224.00

Engineer/Scientist II

Mathew, Rooni

4.00

169.00

676.00

Support Staff Engineer

Manian, Dinesh

84.00

100.00

8,400.00

Totals

152.00

21,300.00

Total Labor

21,300.00

Total this Task

\$21,300.00

Task 04 LPR/NB Hydrodynamic Model

Professional Personnel

Hours

Rate

Amount

Engineer/Scientist II

Mathew, Rooni

13.00

169.00

2,197.00

Support Staff Engineer

Manian, Dinesh

24.00

100.00

2,400.00

Totals

37.00

4,597.00

Total Labor

4,597.00

Total this Task

\$4,597.00

Task 05 LPR/NB Sediment Transport Model

Professional Personnel

Hours

Rate

Amount

Engineer/Scientist III

Canizares, Rafael

2.00

191.00

382.00

Engineer/Scientist II

Mathew, Rooni

94.00

169.00

15,886.00

Staff Engineer/Scientist

Xiong, Yi

73.50

117.00

8,599.50

ACH Payment Remittance Information

Bank Account Name: Moffatt & Nichol

Bank Number: 4159349729

Routing: 121000248

Project	6664-01	Lower Passaic River/Newark Bay TOM 7	Invoice	68359
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Support Staff Engineer

Manian, Dinesh

110.00

100.00

11,000.00

Totals

279.50

35,867.50

Total Labor

35,867.50

Total this Task

\$35,867.50

Task 06 LPR/NB Organic Carbon Model

Professional Personnel

Hours

Rate

Amount

Engineer/Scientist II

Mathew, Rooni

26.00

169.00

4,394.00

Staff Engineer/Scientist

Xiong, Yi

3.00

117.00

351.00

Totals

29.00

4,745.00

Total Labor

4,745.00

Total this Task

\$4,745.00

Task 07 LPR/NB Contaminant Fate & Transport

Professional Personnel

Hours

Rate

Amount

Engineer/Scientist II

Mathew, Rooni

19.50

169.00

3,295.50

Staff Engineer/Scientist

Xiong, Yi

27.50

117.00

3,217.50

Totals

47.00

6,513.00

Total Labor

6,513.00

Total this Task

\$6,513.00

Task XY Expenses

Reimbursable Expenses

Postage & Delivery

36.00

Computer Software & Hardware

451.78

Total Reimbursables

487.78

487.78

Total this Task

\$487.78

Total this Phase

\$116,790.78

ACH Payment Remittance Information
Bank Account Name: Moffatt & Nichol
Bank Number: 4159349729
Routing: 121000248

Project	6664-01	Lower Passaic River/Newark Bay TOM 7		Invoice	68359
Limit		Current	Prior	To-Date	
Total Billings		116,790.78	474,425.33	591,216.11	
Limit				746,232.00	
Remaining				155,015.89	
TOTAL DUE THIS INVOICE					\$116,790.78

Please remit payment of this invoice to: Moffatt & Nichol
 ABA #121000248
 Account #4159349729
 Swift #WFBUS6WFFX
 Wells Fargo Bank
 111 W. Ocean Blvd., Suite 300
 Long Beach, CA 90802 USA

ACH Payment Remittance Information Bank Account Name: Moffatt & Nichol Bank Number: 4159349729 Routing: 121000248
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Project	6664-01	Lower Passaic River/Newark Bay TOM 7	Invoice	68359
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Billing Backup

Thursday, March 06, 2014

Moffatt & Nichol

Invoice 68359 Dated 3/6/2014

2:49:52 PM

Project	6664-01	Lower Passaic River/Newark Bay TOM 7
Phase	K	TOM 7
Task	01	Coordination and Meetings

Professional Personnel

			Hours	Rate	Amount
Engineer/Scientist III					
1548	Canizares, Rafael	12/7/2013	1.00	191.00	191.00
1548	Canizares, Rafael	12/7/2013	2.00	191.00	382.00
1548	Canizares, Rafael	12/14/2013	2.00	191.00	382.00
1548	Canizares, Rafael	12/14/2013	2.00	191.00	382.00
1548	Canizares, Rafael	12/21/2013	2.00	191.00	382.00
1548	Canizares, Rafael	12/21/2013	2.00	191.00	382.00
1548	Canizares, Rafael	12/21/2013	2.00	191.00	382.00
1548	Canizares, Rafael	12/28/2013	4.00	191.00	764.00
1548	Canizares, Rafael	1/11/2014	4.00	191.00	764.00
1548	Canizares, Rafael	1/11/2014	1.00	191.00	191.00
1548	Canizares, Rafael	1/18/2014	1.00	191.00	191.00
1548	Canizares, Rafael	1/18/2014	4.00	191.00	764.00
1548	Canizares, Rafael	1/18/2014	5.00	191.00	955.00
1548	Canizares, Rafael	1/25/2014	4.00	191.00	764.00
1548	Canizares, Rafael	1/25/2014	4.00	191.00	764.00
1548	Canizares, Rafael	1/25/2014	6.00	191.00	1,146.00
Engineer/Scientist II					
2219	Mathew, Rooni	12/7/2013	3.00	169.00	507.00
2219	Mathew, Rooni	12/7/2013	1.50	169.00	253.50
2219	Mathew, Rooni	12/7/2013	2.00	169.00	338.00
2219	Mathew, Rooni	12/14/2013	2.00	169.00	338.00
2219	Mathew, Rooni	12/14/2013	1.00	169.00	169.00
2219	Mathew, Rooni	12/14/2013	1.00	169.00	169.00
2219	Mathew, Rooni	12/21/2013	8.00	169.00	1,352.00
2219	Mathew, Rooni	12/21/2013	5.00	169.00	845.00
2219	Mathew, Rooni	12/21/2013	4.00	169.00	676.00
2219	Mathew, Rooni	12/21/2013	5.00	169.00	845.00
2219	Mathew, Rooni	1/4/2014	2.00	169.00	338.00
2219	Mathew, Rooni	1/11/2014	4.00	169.00	676.00
2219	Mathew, Rooni	1/11/2014	4.00	169.00	676.00
2219	Mathew, Rooni	1/11/2014	1.00	169.00	169.00
2219	Mathew, Rooni	1/11/2014	2.00	169.00	338.00
2219	Mathew, Rooni	1/18/2014	2.00	169.00	338.00

ACH Payment Remittance Information

Bank Account Name: Moffatt & Nichol

Bank Number: 4159349729

Routing: 121000248

Project	6664-01	Lower Passaic River/Newark Bay TOM 7			Invoice	68359
2219	Mathew, Rooni	1/25/2014	.50	169.00	84.50	
2219	Mathew, Rooni	1/25/2014	4.00	169.00	676.00	
	Totals		98.00		17,574.00	
	Total Labor					17,574.00
				Total this Task		\$17,574.00

Task	02	Data Analysis and Monitoring Design
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Professional Personnel

			Hours	Rate	Amount	
Engineer/Scientist III						
1548	Canizares, Rafael	12/21/2013	2.00	191.00	382.00	
1548	Canizares, Rafael	1/18/2014	2.00	191.00	382.00	
Engineer/Scientist II						
2219	Mathew, Rooni	12/14/2013	1.50	169.00	253.50	
2219	Mathew, Rooni	12/21/2013	2.50	169.00	422.50	
2219	Mathew, Rooni	12/21/2013	4.00	169.00	676.00	
2219	Mathew, Rooni	12/21/2013	3.00	169.00	507.00	
2219	Mathew, Rooni	12/28/2013	2.00	169.00	338.00	
2219	Mathew, Rooni	1/4/2014	14.00	169.00	2,366.00	
2219	Mathew, Rooni	1/4/2014	4.00	169.00	676.00	
2219	Mathew, Rooni	1/11/2014	16.00	169.00	2,704.00	
2219	Mathew, Rooni	1/18/2014	25.50	169.00	4,309.50	
2219	Mathew, Rooni	1/18/2014	4.00	169.00	676.00	
2219	Mathew, Rooni	1/25/2014	10.00	169.00	1,690.00	
2219	Mathew, Rooni	1/25/2014	3.00	169.00	507.00	
2219	Mathew, Rooni	1/25/2014	7.00	169.00	1,183.00	
2219	Mathew, Rooni	1/25/2014	3.00	169.00	507.00	
Staff Engineer/Scientist						
2403	Xiong, Yi	12/21/2013	15.00	117.00	1,755.00	
2403	Xiong, Yi	12/28/2013	8.00	117.00	936.00	
2403	Xiong, Yi	12/28/2013	8.00	117.00	936.00	
Support Staff Engineer						
2301	Manian, Dinesh	12/14/2013	6.00	100.00	600.00	
2301	Manian, Dinesh	12/14/2013	12.00	100.00	1,200.00	
2301	Manian, Dinesh	12/28/2013	16.00	100.00	1,600.00	
2301	Manian, Dinesh	1/4/2014	8.00	100.00	800.00	
2301	Manian, Dinesh	1/11/2014	3.00	100.00	300.00	
	Totals		179.50		25,706.50	
	Total Labor					25,706.50
				Total this Task		\$25,706.50

Task	03	System Understanding
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ACH Payment Remittance Information Bank Account Name: Moffatt & Nichol Bank Number: 4159349729 Routing: 121000248
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Project	6664-01	Lower Passaic River/Newark Bay TOM 7	Invoice	68359
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Professional Personnel

			Hours	Rate	Amount	
Engineer/Scientist III						
1548	Canizares, Rafael	12/7/2013	2.00	191.00	382.00	
1548	Canizares, Rafael	12/14/2013	12.00	191.00	2,292.00	
1548	Canizares, Rafael	12/21/2013	20.00	191.00	3,820.00	
1548	Canizares, Rafael	12/28/2013	8.00	191.00	1,528.00	
1548	Canizares, Rafael	1/11/2014	4.00	191.00	764.00	
1548	Canizares, Rafael	1/18/2014	10.00	191.00	1,910.00	
1548	Canizares, Rafael	1/25/2014	8.00	191.00	1,528.00	
Engineer/Scientist II						
2219	Mathew, Rooni	1/18/2014	4.00	169.00	676.00	
Support Staff Engineer						
2301	Manian, Dinesh	12/7/2013	8.00	100.00	800.00	
2301	Manian, Dinesh	12/7/2013	8.00	100.00	800.00	
2301	Manian, Dinesh	12/21/2013	16.00	100.00	1,600.00	
2301	Manian, Dinesh	12/28/2013	8.00	100.00	800.00	
2301	Manian, Dinesh	1/11/2014	16.00	100.00	1,600.00	
2301	Manian, Dinesh	1/18/2014	12.00	100.00	1,200.00	
2301	Manian, Dinesh	1/25/2014	16.00	100.00	1,600.00	
	Totals		152.00		21,300.00	
	Total Labor					21,300.00
				Total this Task		\$21,300.00

Task 04 LPR/NB Hydrodynamic Model

Professional Personnel

			Hours	Rate	Amount	
Engineer/Scientist II						
2219	Mathew, Rooni	12/28/2013	6.00	169.00	1,014.00	
2219	Mathew, Rooni	1/11/2014	7.00	169.00	1,183.00	
Support Staff Engineer						
2301	Manian, Dinesh	12/7/2013	8.00	100.00	800.00	
2301	Manian, Dinesh	12/21/2013	8.00	100.00	800.00	
2301	Manian, Dinesh	1/18/2014	8.00	100.00	800.00	
	Totals		37.00		4,597.00	
	Total Labor					4,597.00
				Total this Task		\$4,597.00

Task 05 LPR/NB Sediment Transport Model

ACH Payment Remittance Information
Bank Account Name: Moffatt & Nichol
Bank Number: 4159349729
Routing: 121000248

Project	6664-01	Lower Passaic River/Newark Bay TOM 7	Invoice	68359
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Professional Personnel

			Hours	Rate	Amount
Engineer/Scientist III					
1548	Canizares, Rafael	1/11/2014	2.00	191.00	382.00
Engineer/Scientist II					
2219	Mathew, Rooni	12/7/2013	6.50	169.00	1,098.50
2219	Mathew, Rooni	12/7/2013	8.00	169.00	1,352.00
2219	Mathew, Rooni	12/7/2013	19.00	169.00	3,211.00
2219	Mathew, Rooni	12/7/2013	6.00	169.00	1,014.00
2219	Mathew, Rooni	12/7/2013	8.00	169.00	1,352.00
2219	Mathew, Rooni	12/14/2013	8.00	169.00	1,352.00
2219	Mathew, Rooni	12/14/2013	5.50	169.00	929.50
2219	Mathew, Rooni	12/14/2013	8.00	169.00	1,352.00
2219	Mathew, Rooni	12/14/2013	6.00	169.00	1,014.00
2219	Mathew, Rooni	12/14/2013	6.00	169.00	1,014.00
2219	Mathew, Rooni	12/21/2013	4.00	169.00	676.00
2219	Mathew, Rooni	12/28/2013	2.00	169.00	338.00
2219	Mathew, Rooni	1/25/2014	2.50	169.00	422.50
2219	Mathew, Rooni	1/25/2014	4.50	169.00	760.50
Staff Engineer/Scientist					
2403	Xiong, Yi	12/7/2013	7.00	117.00	819.00
2403	Xiong, Yi	12/7/2013	7.50	117.00	877.50
2403	Xiong, Yi	12/7/2013	8.00	117.00	936.00
2403	Xiong, Yi	12/7/2013	8.50	117.00	994.50
2403	Xiong, Yi	12/7/2013	9.00	117.00	1,053.00
2403	Xiong, Yi	12/14/2013	6.00	117.00	702.00
2403	Xiong, Yi	12/14/2013	8.50	117.00	994.50
2403	Xiong, Yi	12/14/2013	8.50	117.00	994.50
2403	Xiong, Yi	12/14/2013	3.50	117.00	409.50
2403	Xiong, Yi	12/14/2013	7.00	117.00	819.00
Support Staff Engineer					
2301	Manian, Dinesh	12/7/2013	5.00	100.00	500.00
2301	Manian, Dinesh	12/14/2013	2.00	100.00	200.00
2301	Manian, Dinesh	12/14/2013	16.00	100.00	1,600.00
2301	Manian, Dinesh	12/21/2013	3.00	100.00	300.00
2301	Manian, Dinesh	12/21/2013	8.00	100.00	800.00
2301	Manian, Dinesh	12/28/2013	8.00	100.00	800.00
2301	Manian, Dinesh	1/4/2014	8.00	100.00	800.00
2301	Manian, Dinesh	1/11/2014	16.00	100.00	1,600.00
2301	Manian, Dinesh	1/18/2014	20.00	100.00	2,000.00
2301	Manian, Dinesh	1/25/2014	24.00	100.00	2,400.00
Totals			279.50		35,867.50
Total Labor					35,867.50

ACH Payment Remittance Information Bank Account Name: Moffatt & Nichol Bank Number: 4159349729 Routing: 121000248
--

Project	6664-01	Lower Passaic River/Newark Bay TOM 7	Invoice	68359
Total this Task			\$35,867.50	

Task 06 LPR/NB Organic Carbon Model

Professional Personnel

			Hours	Rate	Amount
Engineer/Scientist II					
2219	Mathew, Rooni	12/7/2013	1.00	169.00	169.00
2219	Mathew, Rooni	12/21/2013	.50	169.00	84.50
2219	Mathew, Rooni	12/28/2013	6.00	169.00	1,014.00
2219	Mathew, Rooni	1/4/2014	1.00	169.00	169.00
2219	Mathew, Rooni	1/11/2014	6.00	169.00	1,014.00
2219	Mathew, Rooni	1/18/2014	4.50	169.00	760.50
2219	Mathew, Rooni	1/18/2014	7.00	169.00	1,183.00
Staff Engineer/Scientist					
2403	Xiong, Yi	12/21/2013	1.00	117.00	117.00
2403	Xiong, Yi	12/21/2013	2.00	117.00	234.00
	Totals		29.00		4,745.00
Total Labor					4,745.00
Total this Task					\$4,745.00

Task 07 LPR/NB Contaminant Fate & Transport

Professional Personnel

			Hours	Rate	Amount
Engineer/Scientist II					
2219	Mathew, Rooni	12/7/2013	1.00	169.00	169.00
2219	Mathew, Rooni	12/14/2013	1.00	169.00	169.00
2219	Mathew, Rooni	12/28/2013	8.00	169.00	1,352.00
2219	Mathew, Rooni	1/4/2014	3.00	169.00	507.00
2219	Mathew, Rooni	1/18/2014	1.00	169.00	169.00
2219	Mathew, Rooni	1/25/2014	2.00	169.00	338.00
2219	Mathew, Rooni	1/25/2014	1.00	169.00	169.00
2219	Mathew, Rooni	1/25/2014	2.50	169.00	422.50
Staff Engineer/Scientist					
2403	Xiong, Yi	12/14/2013	1.00	117.00	117.00
2403	Xiong, Yi	12/14/2013	3.00	117.00	351.00
2403	Xiong, Yi	12/14/2013	.50	117.00	58.50
2403	Xiong, Yi	12/14/2013	1.00	117.00	117.00
2403	Xiong, Yi	12/21/2013	1.00	117.00	117.00
2403	Xiong, Yi	12/21/2013	8.00	117.00	936.00
2403	Xiong, Yi	12/21/2013	7.00	117.00	819.00

ACH Payment Remittance Information Bank Account Name: Moffatt & Nichol Bank Number: 4159349729 Routing: 121000248
--

Project	6664-01	Lower Passaic River/Newark Bay TOM 7			Invoice	68359
2403	Xiong, Yi	12/21/2013	6.00	117.00	702.00	
	Totals		47.00		6,513.00	
	Total Labor					6,513.00
				Total this Task		\$6,513.00

Task	XY	Expenses		
Reimbursable Expenses				
Postage & Delivery				
AP	196753	12/30/2013	Federal Express Corp / INV 250371898 TID 797395890880 / Invoice: 250371898, 12/20/2013	11.32
AP	196772	12/30/2013	Federal Express Corp / INV 251135835 TID 797475516541 / Invoice: 251135835, 12/27/2013	11.28
AP	196772	12/30/2013	Federal Express Corp / INV 251135835 TID 797464280912 / Invoice: 251135835, 12/27/2013	13.40
Computer Software & Hardware				
EX	000000049943	12/12/2013	Mathew, Rooni / Office Depot	152.40
EX	000000050136	12/17/2013	Mathew, Rooni / Office Depot	81.65
EX	000000050680	1/9/2014	Mathew, Rooni / Office Depot	76.20
EX	000000050680	1/14/2014	Mathew, Rooni / Office Depot	141.53
Total Reimbursables				487.78
				487.78
Total this Task				\$487.78
Total this Phase				\$116,790.78
Total this Project				\$116,790.78
Total this Report				\$116,790.78

ACH Payment Remittance Information
Bank Account Name: Moffatt & Nichol
Bank Number: 4159349729
Routing: 121000248



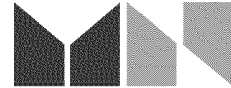
104 West 40th Street
14th floor
New York, NY 10018

(212) 768-7454
Fax (212) 768-7936

Detailed Description of work done by M&N personnel associated to the LPR/NB Modeling Program Task Order Memoranda 7 - Scope of Work for the period 12/01/2013 to 01/25/2014 M&N Project No. 6664

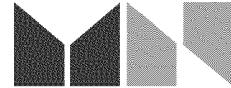
Hydrodynamics Principal Investigator - Rafael Cañizares.

Task 1 – Project Management	<ul style="list-style-type: none">• Internal coordination with Deltares and M&N• Calls and Coordination with Project Coordinator including prepare material such as Dash Board reports.• Prepare and review invoices, including internal control of invoicing and budgets for project. Review, October November Invoices• Coordination with Project Coordinator and AQEA including calls for modeling update• Call with AQEA. Simulations, coordination on models• Call with AQEA - status and EPA deliverables• Internal discussion and communications with PC and AQEA on deliverables for EPA• Discussion with AQEA about projections and future runs• RI report review and writing• Call with AQEA to prepare for TC meeting, review TC presentation, internal discussion of ST model results,• Prepare document of TOM7 tasks status
Task 2 – Data Analysis	<ul style="list-style-type: none">• Prepare bathymetry for propeller scour• Review vessel data
Task 3 – System Understanding	<ul style="list-style-type: none">• Internal discussions, upstream boundary, model updates for ST, other.• Lower LPR bathymetry analysis and Propeller wash calculation• Development of bathymetry maps, Scour calculations• Propeller wash analysis• Propeller Wash• Propeller Wash - integration with model.
Task 5 – LPR/NB Sediment Transport Modeling	<ul style="list-style-type: none">• Discuss status and results of ST model

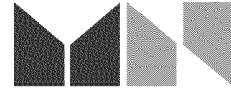


Rooni Mathew.

Task 1 – Project Management	<ul style="list-style-type: none"> • Call-in to TC meeting • Compile attachments for CPG-EPA letter for Nov 22 • Conference call with AQEA to discuss TC meeting, calibration strategy, develop HD/ST presentation for TC meeting • Compile projection runs for transmittal to AQEA/EPA, compile latest HD/ST outputs for AQEA • Conference call with AQEA to discuss code/input/output transmittal to EPA • Develop inventory of codes/inputs/outputs to transfer per EPA request • Compile material for EPA, develop OC linkage example • Conference call with AQEA to discuss Alternative projections runs, transmit remaining 1112 files to HQI • Relaunch runs for transfer to EPA to save correct linkage, transfer files to EPA • Develop options for HD/ST runs for projection runs • Call-in TC meeting • Develop presentation for TC meeting • Conference call with AQEA to discuss projection runs, TC meeting, new ST run • Transmit ST/CFT projection results to AQEA • Develop proposal for revised linkage & discuss with AQEA • Develop agenda for Feb 4 MSC meeting • Develop presentation for Feb 4 MSC meeting
Task 2 – Data Analysis	<ul style="list-style-type: none"> • Discuss PWCM data issues with OSI, develop data plots for OSI • Revise Fall ABS-SSC regressions • Develop revised ABS-SSC estimates • Revise Fall ABS-SSC regressions • Correct 0910 BCs with rev DD rating curve for clays/silts/sand • Revise Fall PWCM ABS-SSC • Finalize DD rating curve and GSD inputs, develop sens runs with 7 classes • Review LPR Sedflume data, develop alternative TauCr and consol model inputs • Reprocess Fall ABS-SSC analyses - flux balances, fluff layer re-entrainment analysis, etc. • Revise fluff layer props with shear stresses form latest bathy • Develop Spring PWCM ABS-SSC relationship • Review navigation scour data analysis • Review navigation scour data analysis, filter/standardize Fall PWCM data for model-data comparisons



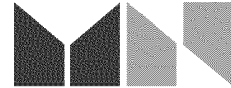
	<ul style="list-style-type: none"> Filter/standardize Fall PWCM data for model-data comparisons
	<ul style="list-style-type: none"> Review system understanding with latest ABS-SSC estimates, compare to model performance
Task 4 – LPR/NB Hydrodynamic Modeling	<ul style="list-style-type: none"> Develop & review salinity model-data for CWCM with 2004 bathy & EPA BCs Debug hydro instabilities in transition from 1 bathy to another in NB
Task 5 – LPR/NB Sediment Transport Modeling	<ul style="list-style-type: none"> Review/finalize new DD solids rating curve, develop new BCs, launch projection run for Alt 6 with MNR bathy & solids release, review/respond to SEA Spring PWCM ADCP issues Debug optional advection/dispersion code, review ST sensitivity runs with rev DD rating curve Debug optional advection/dispersion code Discuss ST code issues with selective advection/dispersion with HQI, review wave analysis, rev solids rating curve BCs, develop high flow sensitivity runs with new BCs, review PWCM data issues with OSI Launch rev ST run with old solids BCs, debug ST run with optional advection-dispersion for NC2/3 Debug model with optional advection-dispersion, debug Alt 6 with solids release & relaunch runs, review sensitivity with new DD solids rating curve Debug model with optional advection-dispersion Debug model with optional advection-dispersion & review with HQI Develop/test code for optional water column vertical profile calculations, develop ABS-SSC relation for Fall PWCM Test code with 4 cohesive classes with probability deposition bug fix, review sensitivity runs with new solids rating curve and sensitivity to critical shear stress multiple Test/debug ST run with 4 cohesive classes Code changes for C1-C2 transfer Review ST runs, launch additional sensitivity, launch 0506-1213 runs for MSC meeting Review ST runs, launch additional sensitivity.
Task 6 – LPR/NB Organic Carbon Modeling	<ul style="list-style-type: none"> Debug -ve values in AOC outputs Review AOC -ve concentration debugging Review/debug AOC issues Debug AOC code issues Debug and comment on AOC code questions Debug NEGPORE issue, debug run crash with clays a cohesive, debug ST-OC-CFT sedimentation rates issues Review ST-OC bed thickness changes, revise code for clays as cohesive



Task 7 – LPR/NB Contaminate Fate and Transport Modeling	<ul style="list-style-type: none"> • Launch RCA Alt 6 sensitivity run with solids releases • Develop removal vol summary for Integral • Review processing scripts for projection runs, debug solids release run crashes • Develop options for HD/ST runs • Conference call with AQEA/Integral to discuss remediation inputs • Respond to AQEA questions on model-data comparisons • Discuss projection runs setup with AQEA • Discuss projection runs setup with AQEA, post-process runs for foodchain output
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Dinesh Manian

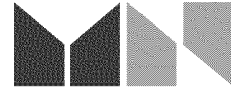
Task 2 – Data Analysis	<ul style="list-style-type: none"> • Analyzing AIS ship traffic data; correlations with bathymetric change • Bathymetric data analysis: Longitudinal variability in gross erosion and accumulation during periods between subsequent surveys 1995 to 2012 • Processing bathymetric data to set up detailed model-data comparisons of bathymetric change between subsequent surveys • Setting up model-data comparisons of bathymetric change
Task 3 – System Understanding	<ul style="list-style-type: none"> • Processing non-stationary wave runs; Sensitivity to wind-wave growth formulations • Processing wave sensitivity runs to formulation for wind-wave generation; Comparisons with data • Sensitivity runs to estimate effect of waves on total shear stress in NB; Correlation between density of ship traffic and bathymetric change • Comparing measured longitudinal variability in bathymetric change, with the variability in model predicted changes. Settling velocity computation using re-processed ABS data from Fall PWCM • Comparing volume of erosion near RM 0 due to ship traffic with volume of sediment flux through the cross-section to understand their relative significance • Assessing and modeling impact of ship traffic on bed scour in lower mile and NB
Task 4 – LPR/NB Hydrodynamic Modeling	<ul style="list-style-type: none"> • Setting up non-stationary wave simulation; Model-data comparisons; • Debugging computation of combined wave-current stresses in ECOM • Processing non-stationary wave model results for external wave inputs to long-term ECOM model



Task 5 – LPR/NB Sediment Transport Modeling	<ul style="list-style-type: none"> • Setting up BCs for ST with smooth transition during bathymetry updates; based on latest full-grid runs • Sediment Transport sensitivity runs with effect of wave shear stress; Processing BCs for long-term runs and projection runs; • Setting up BCs for long term projection/sensitivity runs • Detailed comparisons of bathymetric changes predicted by the model with bed changes based on survey data from 1995 to 2012 • Processing ST sensitivity runs to critical shear stress • Processing ST sensitivity runs to critical shear stress, settling velocities • ST model final calibration • Processing final Sediment Transport sensitivity runs; Model-data comparisons
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Yi Xiong

Task 2 – Data Analysis	<ul style="list-style-type: none"> • Collect suspended solids data to evaluate solids rating curve at the upstream boundary. • Work on settling velocity calculation using Cheng's method.
Task 5 – LPR/NB Sediment Transport Modeling	<ul style="list-style-type: none"> • Get the TSS data and generate the TSS time series plots; Take a look at the plots; generate another sets of pdf plots. • Discuss Rating Curve fitting; Set up steps to update 5 and 7 classes of sediment boundary inputs. Calculate sediment load and sediment concentration for a particular year. • Generate new TSS plots; Work on Matlab and Fortran programs to extract TSS data from sediment and hydrodynamic outputs for the 4-panel TSS 0910 time series plots. • Launch the updated sediment boundary run and 2 sediment transport sensitivity runs. Generate time series TSS plots; modify the input read and write programs to re-generate the coh_sed.inp files and the TSS time series plots. • Verify and generate 5 and 7 classes coh_sed.inp for all 19 years. Make TSS boundary plots for original and updated coh_sed.inp files. Launch the original sediment transport testing run. • Compare the new and sensitivity run results and cross plots; Compare rating curve vs measured data. • Debug and modify Matlab script and re-generate the measured & Estimated data plot; Revise Fortran program to update coh_sed.inp files. Re-generate sediment boundary plot. Re-launch the 3 testing runs with updated coh_sed.inp files. • Explain the coh_sed.inp update steps and show the results.



	<p>See the boundary TSS results. Work on 0910 TSS boundary (coh_sed.inp.0910)based on both rating curve and observed data.</p> <ul style="list-style-type: none"> • Work on 0910 TSS boundary (coh_sed.inp.0910) based on both rating curve and observed data. • Make plots, revise time series plots and generate the slides for TSS boundary condition analysis. Launch 3 long terms sediment transport runs.
Task 6 – LPR/NB Organic Carbon Modeling	<ul style="list-style-type: none"> • Start to look into the Negative Value errors; • Revise hsed.f and make a testing run to show the results for AQEA.
Task 7 – LPR/NB Contaminate Fate and Transport Modeling	<ul style="list-style-type: none"> • Generate and send AQEA the outputs. • Work on AQEA's outputs request. • Send AQEA foodchain data. • Launch Alt5 and Alt7 with the revised dredge files. • Provide RCATOX results to AQEA. • Update inputs and Launch 3 7 classes' sediment transport runs; resume the long-term sediment transport run with new coh_sed.inp. • Work on 0910 coh_sed.inp; Make plot to compare Measured, Rating Curve, Old coh_sed.inp and New coh_sed.inp time series TSS. • Make TSS boundary comparison plots; Do 0910 7 classes plots; Clean disk, move runs and resume them. Look into AQEA's post-processors. Generate and Send AQEA the rest 16-textfile and Foodchain outputs. • Generate Water column flux outputs and send them to AQEA. • Check and Re-send AQEA the specific data. • Modify script and generate 45-Year TCDD and TetraPCB water column flux for all runs. • Send AQEA updated Tetra-PCB data. • Clean the unnecessary folder; take a look at the run directory changes. • Collect all TCDD and PCB projection run locations.



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Tracking ID no.	797395890880
Invoice no.	2-503-71898
Account no.	1903-9632-0
Ship date	12/13/2013
Invoice date	12/20/2013
Due date	01/04/2014
Tracking ID Balance due	\$0.00
Status	Closed

Messages

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Deborah Bashkoff
Moffatt & Nichol
104 West 40th Street
NEW YORK NY 10018
US

Recipient Information

Tolga Onkaya
Anchor QEA, LLC
305 West Grand Ave
MONTVALE NJ 07645
US

Shipment Details

Ship date	12/13/2013
Payment type	Shipper
Service type	FedEx Standard Overnight
Zone	02
Package type	Customer Packaging
Weight	1.00 lbs
Pieces	1
Meter No.	5026004
Declared value	\$0.00

Charges

Transportation Charge	19.90
Fuel Surcharge	0.98
Weekday Delivery	0.00
Discount	-8.96
Earned Discount	-0.60
Total charges	\$11.32

Original Reference

Customer reference no.	6664-01 K, xy
Department no.	
Reference #2	
Reference #3	

Updated Reference [Edit](#)

Customer reference no.	
Department no.	
Reference #2	
Reference #3	

Proof of Delivery

Delivery date	12/16/2013 10:20
Service area code	A2
Signed by	Y.SCHBERT

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Tracking ID no.	797464280912
Invoice no.	2-511-35835
Account no.	1903-9632-0
Ship date	12/19/2013
Invoice date	12/27/2013
Due date	01/11/2014
Tracking ID Balance due	\$0.00
Status	Closed

Messages

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Rooni Matthew
Moffatt & Nichol
104 West 40th Street
NEW YORK NY 10018
US

Recipient Information

James Wands
HDR- Hydroqual
1200 Macarther Boulevard
MAHWAH NJ 07430
US

Shipment Details

Ship date	12/19/2013
Payment type	Shipper
Service type	FedEx Priority Overnight
Zone	02
Package type	FedEx Pak
Weight	1.00 lbs
Pieces	1
Meter No.	5026004
Declared value	\$100.00

Charges

Transportation Charge	23.55
Declared Value Charge	0.00
Fuel Surcharge	1.16
Weekday Delivery	0.00
Discount	-10.60
Earned Discount	-0.71
Total charges	\$13.40

Original Reference

Customer reference no.	6664-01 xy
Department no.	
Reference #2	
Reference #3	

Updated Reference [Edit](#)

Customer reference no.	
Department no.	
Reference #2	
Reference #3	

Proof of Delivery

Delivery date	12/20/2013 10:36
Service area code	A2
Signed by	L.MUZIO

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Cost allocation
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Tracking ID no.	797475516541
Invoice no.	2-511-35835
Account no.	1903-9632-0
Ship date	12/20/2013
Invoice date	12/27/2013
Due date	01/11/2014
Tracking ID Balance due	\$0.00
Status	Closed

Messages

Distance Based Pricing, Zone 2
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Deborah Bashkoff
Moffatt & Nichol
104 West 40th Street
NEW YORK NY 10018
US

Recipient Information

James Wands
HDR-Hydroqual
1200 Macarthur Blvd.
MAHWAH NJ 07430
US

Shipment Details

Ship date	12/20/2013
Payment type	Shipper
Service type	FedEx Priority Overnight
Zone	02
Package type	FedEx Envelope
Weight	0.00 lbs
Pieces	1
Meter No.	5026004
Declared value	\$0.00

Charges

Transportation Charge	19.80
Fuel Surcharge	0.98
Weekday Delivery	0.00
Discount	-8.91
Earned Discount	-0.59
Total charges	\$11.28

Original Reference

Customer reference no.	6664-01 xy
Department no.	
Reference #2	
Reference #3	

Updated Reference [Edit](#)

Customer reference no.	
Department no.	
Reference #2	
Reference #3	

Proof of Delivery

Delivery date	12/23/2013 09:53
Service area code	A2
Signed by	L.MUZIO

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Cost allocation
Shipment Notes

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Detailed Expense Report

Friday, December 13, 2013

7:26:38 AM

Moffatt & Nichol

Employee 2219 Mathew, Rooni

Signed

Approved

Organization MNE:NE:NY

Expense Report: Hard Disks for EPA Transmittal

Report Date: 12/13/2013

Submitted

Date	Category	Description	Project	Phase	Task	Bill	Paid	Account	Currency Code	[LabelDocum ents]	Amount	Payment Amount
12/12/2013	Computer Supplies (Hardware)	Office Depot	6664-01	K	XY	<input checked="" type="checkbox"/>	<input type="checkbox"/>	530.00	USD		152.40	152.40 ✓

Lower Passaic River/Newark Bay TOM 7

Business Reason: External hard drives for model transmittal to EPA

Total Expenses	152.40
Amount Advanced	
Company Paid	
Total Due	152.40

OFFICE DEPOT STORE 555

1441 Broadway
New York NY 10018
(212) 764-2465

Date 12/12/2013 3:21 PM
Version 13.4.7
Store 555
Register 35
Transaction # 178
Employee 638079
SALE

372337	HRD DRV,500GB	69.99	SS
800314	HRD DRV,500GB,SLV	69.99	SS
Subtotal:		139.98	
Sales Tax:		12.42	
Total:		152.40	
Visa 2531:		152.40	

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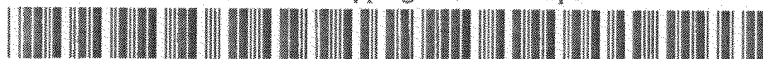
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Valid in-store only. Must present this original coupon (photocopies/reproductions not valid) to cashier at time of purchase. Not valid for purchases made in Office Depot convenience/clearance/closing stores. Cannot be combined with Store Purchasing or Procurement Cards. Coupon is good for one-time use only, is not transferable, is not for resale or auction and cannot be combined with other sales, offers or promotions. While supplies last. No rain checks. No cash back. Void where prohibited. Limit 1 coupon per household/business.

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Detailed Expense Report

Wednesday, December 18, 2013

12:14:36 PM

Moffatt & Nichol

Employee 2219 Mathew, Rooni

Signed

Approved

Organization MNE:NE:NY

Expense Report: Additional hard disk for EPA transfer

Report Date: 12/18/2013

Submitted

Date	Category	Description	Project	Phase	Task	Bill	Paid	Account	Currency Code	[LabelDocum ents]	Amount	Payment Amount
12/17/2013	Computer Supplies (Hardware)	Office Depot	6664-01	K	XY	<input checked="" type="checkbox"/>	<input type="checkbox"/>	530.00	USD		81.65	81.65

Lower Passaic River/Newark Bay TOM 7

Business Reason: Larger capacity hard-disk for EPA transmittal. Hard-disk purchased last to be used in the future for AQEA transmittal

Total Expenses	81.65
Amount Advanced	
Company Paid	
Total Due	81.65

OFFICE DEPOT STORE 555

1441 Broadway
New York NY 10018
(212) 764-2465

Date 12/17/2013 1:45 PM
Version 13.4.7
Store 555
Register 45
Transaction # 217
Employee 573330
SALE

179714	HD,PORT,CANVIO,1TB	74.99	SS
	Subtotal:	74.99	
	Sales Tax:	6.66	
	Total:	81.65	
	Visa 2531:	81.65	

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Detailed Expense Report

Friday, January 17, 2014

8:55:14 AM

Moffatt & Nichol

Employee 2219 Mathew, Rooni

Signed

Approved

Organization MNE:NE:NY

Expense Report: HardDisksforQEAnBackup

Report Date: 1/17/2014

Submitted

Date	Category	Description	Project	Phase	Task	Bill	Paid	Account	Currency Code	[LabelDocum ents]	Amount	Payment Amount
1/9/2014	Computer Supplies (Hardware)	Office Depot	6664-01	K	XY	<input checked="" type="checkbox"/>	<input type="checkbox"/>	530.00	USD		76.20	76.20

Lower Passaic River/Newark Bay TOM 7

Business Reason: Hard disk to transmit model outputs
to AQEA

1/14/2014	Computer Supplies (Hardware)	Office Depot	6664-01	K	XY	<input checked="" type="checkbox"/>	<input type="checkbox"/>	530.00	USD		141.53	141.53
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Lower Passaic River/Newark Bay TOM 7

Business Reason: External hard drive for offsite
backup of LPR/NB modeling machines

Total Expenses	217.73
Amount Advanced	
Company Paid	
Total Due	217.73

OFFICE DEPOT STORE 555

1441 Broadway
New York NY 10018
(212) 764-2465

Date 01/09/2014 7:03 PM
Version 13.4.7
Store 555
Register 50
Transaction # 285
Employee 216136
SALE

104002	HRD DRV,BKUP+,1TB	89.99	SS
	Instant Savings	-20.00	
	You Pay		69.99SSS
	Subtotal:		69.99
	Sales Tax:		6.21
	Total:		76.20
	Visa 2531:		76.20

Total Office Depot Savings:
\$20.00

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01/14/2014 13.4.7 2:06 PM
STR 555 REG4 TRN 1566 EMP 573330

SALE

Product ID	Description	Total
104173	HD, BACKUP+ DSK	129.99 SS
Subtotal:		129.99
Sales Tax:		11.54
Total:		141.53
Visa 2531:		141.53

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